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*Cases of Gunshot wounds through the Thorax, with remarks.* By USHER PARSONS, M. D. M. M. S., Surgeon in the United States Navy.

[Communicated to the Editors of the New England Journal.]

### CASE FIRST.

**B**ENJAMIN BAILY, a robust seaman, aged about thirty-seven, was wounded by a canister shot, which entered the chest about one inch from the sternum, passed through the right lung, and out, between the fifth and six ribs, both of which it fractured near their angle. For twelve hours the hæmorrhage was profuse, causing frequent fainting, and was thought to have removed him beyond the reach of medical aid. Consequently his wound was not dressed, nor was his position, which was horizontal, changed, for the first twenty-four hours. With the aid of cordials, he had by this time so far revived, as to be able to speak, and to move his limbs. The wound being now examined, small quantities of frothy blood were found to gush out at every expiration, accompanied with a rushing of air. After removing some pieces of bone from within the wound, and applying light dressings, he was again laid in a horizontal position. These dressings were removed three times in the twenty-four hours, and at each time, the discharge from the wound had been sufficient, to pass through several layers of linen, pledgets of tow, and a blanket. The quantity however gradually diminished, and in two or three days became somewhat serous and very fetid. No febrile symptoms appearing, he was now put upon a nu-

trititious diet, with the free use of port wine; and in the course of a week he was able to sit up to have his wound dressed; and the discharge from it had so far diminished, as to require only two dressings a day. In a fortnight he was able to sit up nearly all day; the matter had become somewhat purulent, and still more diminished in quantity. About this time, some pieces of bone were discharged, after which his general health improved very rapidly. A probe could now be introduced into the chest, and played round in any direction, which plainly indicated a destruction of the lung. The wound being kept open with tents, pus, in small quantities, continued to pass out from the chest till April; five months after the injury was received; when it gradually diminished, and the wound was suffered to close. His general health appeared perfectly restored, except that exposure to sudden transitions of atmospheric temperature, would disorder the respiratory organs much sooner than formerly; and a shortness of breath was more readily induced by exercise. Sometime late in July following, this patient complained of a sense of weight in the chest, oppressed respiration, frequent rigors, and shortly after an inability to lie on the left or uninjured side. His distress increased, and in a week or two, he was unable to lie on either side, or back, or to stand erect; and for the most part rested on his hands and knees. His face was flushed and bloated, pulse very irregular, and there was a remarkable throbbing of the temples. He complained of thirst, total loss of appetite, head-ach, difficulty of breathing, and great restlessness. On examining the chest by percussion, neither the sound, nor sensation to the fingers, resembled what is produced by a healthy chest. In short, every circumstance indicated a collection of pus; and it was determined to give it vent by paracentesis. While preparing for the operation, I for the first time discovered a tumor, rising on the back, a little to the right of the last dorsal vertebra. Suspecting that pus was about to force itself through this part; I endeavoured to make the skin and integuments yield before it, by the application of emolient cataplasms, by which the tumor in a day or two attained to a much larger size, and became somewhat pointed. An abscess lancet, being now plunged into it, gave vent to between two and three pounds of pus; and immediate relief was the consequence. He however complained of faintness, which led me to stop the discharge for that day, by closing the wound and applying a compress. For two or three days in succession, the discharge of pus was again very copious, after



which it gradually diminished. He convalesced so rapidly, that in a fortnight he was able to do partial duty, and four weeks after his chest was evacuated, he was perfectly sound, and as active as any sailor at the battle of Lake Erie, and has remained healthy ever since. It should ere this have been observed, that no foreign substance was discovered among the pus, that could have caused its collection.

#### CASE SECOND.

Capt. Charles Gordon, United States Navy, aged about forty, of slender frame and feeble health, was wounded through the right lung. For the history of this case, from its commencement, till towards its termination, I am indebted to Dr. Gibson of Baltimore, who was consulted in the case in 1811, the year after the wound was received, at which time he obtained the following account from the physician, who had formerly attended. "In January 1810," (says Dr. Worthington to Dr. Gibson.) "I was called to visit captain Gordon, who had been wounded a few days before in a duel. Upon examination, I found that the ball had entered the chest at the end of the seventh rib, near its junction with the cartilage; and passing under the arch of the rib some distance, had made its way out through the muscles, and ranging along over the vertebra lodged just below the inferior angle of the left scapula; where it was covered only by the skin, and was readily extracted. The ball in its passage appeared to have wounded the lung, and fractured the rib near its articulation with the vertebra. Immediately upon receiving the wound, a sudden and copious gush of blood—took place, which had nearly proved fatal; but the bleeding soon ceased, and the patient was able to bear the motion of being conveyed to his lodgings. When I first saw Captain Gordon, (continues Dr. Worthington,) he was extremely feeble and exhausted, had oppressed breathing and fever; suppuration had commenced, and he was confined to his back. It was thought advisable, in order to prevent a lodgement of matter, to keep the posterior wound open, and our attention was accordingly directed to this object. But it soon healed, and no other vent was left for the matter but the original opening, at which the ball entered. This, as was foreseen, produced great inconvenience. The suppuration soon became very great, and captain Gordon's weak state not admitting much motion, the matter had no opportunity of being discharged except morning and eve.

ning, when he was turned over to be dressed. The consequence of its being retained, was absorption and hectic fever, which reduced him so very low, that it was thought for many weeks, he would sink under it. He was however supported by light nourishing diet, antiseptics, and tonics, until he was able to sit up, and finally to be removed from the city. Previously to captain Gordon's being wounded he was in delicate health, had been subject to cough, and was threatened with a pulmonary affection. After the large discharge of blood from the wound the cough ceased; (the bleeding appearing to have removed the cause of it, and, as he had no bloody expectoration, a belief was entertained for a time, that the lungs were not wounded. But the forcible discharge of air from the orifice at every expiration, whenever the dressings were removed, especially after the suppuration became copious, convinced us, that not only the lungs were wounded, but had extensively suppurated. The orifice having a disposition to heal, it was necessary to dilate it, and keep it open by a sponge tent; and once it was laid open to the extent of an inch or two, to give a more free vent to matter." Dr. Worthington adds, that, upon examination of the chest, he discovered, at the place the ball had entered, a fistulous orifice, of sufficient size to admit a large writing quill. From this opening was discharged about half a tea-cup full of purulent matter, and along with this a considerable quantity of air. By introducing the long gunshot probe, he was convinced, that the wounded lung had collapsed, and that the right side of the chest was entirely empty. A tent was constantly kept in the orifice of the wound, which it was requisite to remove three or four times a day, to discharge the matter as it was collected. This discharge gradually decreased, and captain Gordon's health improved to a great degree.

I became acquainted with the case in the summer of 1816, about six years after the injury, and then learned from the patient, that both wounds had several times closed, and that one or the other had as often been forced open by collections of pus within. To prevent a recurrence of this, he had long worn in one of the wounds a silver tube, corked, through which the pus was evacuated daily in the quantity of about one ounce. When suffered to collect in larger quantities, a recumbent posture, with the head and shoulders depressed, caused a discharge of it into the mouth. At every respiration, air rushed in and out at the wound, so that he could blow out a candle held near it, as readily as with his mouth. A probe



introduced into the orifice in the back, could be played round in any direction; and when it was bent to a right angle, two inches from the extremity, this length just measured the distance from the orifice to the diaphragm.

His constitution continued slender,—voice feeble and shrill, and his body much emaciated; but his appetite was voracious, and his digestion good. While in this state, he was most of the time employed in active service, and had long been in the command of the *Constellation*, in which he died, in the Mediterranean, in September, 1816. His health remained nearly the same till within three months of his death, when his digestion became disordered, first by costiveness which terminated in diarrhœa, and soon after loss of appetite ensued, which continued, till complete exhaustion ended his existence.

#### APPEARANCES ON DISSECTION.

The body was examined by Drs. Washington, Ray, Peachy and myself. On raising the sternum, sterno-costal cartilages, and pleura, we found no portion of the right lung remaining, nor any substance occupying its place except some knobs of granulations on the mediastinum, with similar ones surrounding the two orifices made by the ball, and about two ounces of pus on the diaphragm. A splinter of one of the fractured ribs projected about half an inch from the wound in the back, into the chest, and several small fragments of bone were lodged on the diaphragm, to one of which adhered a particle of the fatal ball, half as large as a pea. These lay near the ribs immediately under the wound, and appeared to have irritated the parts, inducing ulceration, and the growth of fungus.

The capacity of this side of the thorax was very much diminished, partly by the approximation of the mediastinum to the ribs, but more by the pushing up of the diaphragm. The abdominal viscera, pressing this against the pleura costalis posteriorly, had caused it to adhere to within about two inches of the wound in the back. The bronchial passage, opening into the vacant side of the chest, was of such a size, as to admit the passing of a large quill up into the mouth.

The other lung was small, and had formed partial adhesions to the pleura costalis; probably in consequence of a pleurisy, with which he had suffered the preceding winter. The heart was extremely small, [but] otherwise of a natural appearance.

The abdominal viscera exhibited no marks of disease, except that the liver was preternaturally large.

*Remarks on the foregoing cases.*

The principal object of these remarks is, to show, that the operation of paracentesis of the thorax might have been servicable in both cases.

Surgeons have not only agreed as to the state of the patient requiring paracentesis, but have united in their choice of the exact point of the thorax, in which the perforation is to be made; fixing the "point of election," as they term it, between the sixth and seventh true ribs, half way between the spine and sternum. When however an opening already exists, as in the foregoing cases, it has rarely been recommended to make another. Surgeons have preferred evacuating the pus once or twice a day, by inclining the body, so as to favour its discharge from the chest through the old wound, although a more depending opening might give free egress to matter as fast as it is formed. Now the advantage of such an opening, in Baily's case, would have been, its not closing prematurely, as the wound did. The constant running would have kept it open, till all was sound within, and thus the train of evils, which the accumulated pus occasioned, in forcing its way through the back, would have been prevented. Evils incomparably greater, than could have arisen from so simple an operation, and which will always be the effect of a premature closure of the wound. But if the wound be high up it will be difficult to prevent its closing, and even if it be kept open artificially, the pus cannot easily be discharged through it, but will accumulate in the cavity of the chest, and finally seek a new outlet in the most depending part, as it did in Baily's case. The result of this case proves that such an opening would have been beneficial, for so soon as a depending outlet was established, the cure was made complete. And is there any objection to such an operation at an early stage of the difficulty? None has occurred to my mind, but on the contrary it seems to me expedient and may often be the means of saving much suffering and even the life of the patient.

In Gordon's case what was there to prevent its terminating in a complete cure, provided a counter opening had been made as early as in Baily's case? The ball was not one quarter as large, and consequently the injury far less. The great difficulty, however, in Gordon's case over the other, seems to have been the lodgement of foreign substances, bone and lead,



within the cavity of the chest. These substances lay on the diaphragm against the ribs; and their irritation had occasioned ulceration, and constant secretion of pus, so that nearly all, which was daily drawn from the wound, was furnished from this source; and it is doubtful, whether a counter opening would have diminished its quantity, or in hardly any degree been serviceable, while those irritating substances remained. The operation however might have removed these substances, and for this reason, it should have been performed, if their presence had been suspected. The examination of the body after death perfectly satisfied me, that a counter opening would have enabled the surgeon to remove these foreign substances with the greatest ease; while it seemed impossible to have done it through the old wound.

I know it has been said by Larrey, that, after the age of thirty five, the operation for empyema, with a wounded lung, will not effect a complete cure. "That it succeeds to this degree only in early life, when the power of the system to restore parts is greatest; and that then a cure is effected by a partial approximation of the walls of the thorax, and the production of new flesh, which will, in process of time, fill up the cavity, formerly occupied by the lung, with a cicatrix." Gordon's age, then, according to Larrey, would have prevented a cure. But Baily's case is certainly an exception to this opinion. He was thirty seven years of age; nor was the cure effected in the above manner; for it is impossible, that a cavity occupied by from four to six pounds of pus, could have been filled up by solid granulations, in the space of the month, in which his cure was effected. There must have remained a cavity, sound, and healthy after the wound was closed; and it is easy to conceive, that Gordon's case might have terminated in the same favourable manner, if an operation, at an early period, had placed it on the same ground; his age notwithstanding.

Larrey seems to have considered the importance of a depending outlet, when he made it in one instance between the third and fourth ribs, counting from below upward, which is a much lower point than has been recommended. I however cannot but think, that when an opening already exists high up, the point for operating may be better determined, by measuring the depth of the chest below this opening, by a probe bent and introduced into the cavity. In favour of this it is to be observed, that, in some cases, and particularly in Gordon's, the diaphragm forms adhesions to the ribs, above the

place of its former attachment; and in such cases a perforation, so low down as Larrey made, might penetrate the abdomen.

Mr. John Bell is the only author, who says much about searching for foreign substances within the chest, and, in cases like Gordon's, this author would direct the cavity to be syringed with warm water, in order to float the substances to the wound. He, however, probably means that pieces of cloth, might be washed out in this manner and not bone and lead; for he says, that, when a ball is lodged on the diaphragm, and empyema is formed, the incision, which lets out the matter, will also allow the ball to drop; and yet this author directs, that paracentesis should be performed at the point of election only, which is not the most depending, and therefore, not the most favourable for the ball to fall through.

The propriety of making a depending outlet in Gordon's case is not a new suggestion. It was recommended to him by one or two eminent surgeons, particularly by Dr. Gibson of Baltimore. What has been said with regard to the appearances on dissection, will in some degree satisfy those gentlemen, of the correctness of their opinion.

In concluding this communication, it may not be improper to notice a remark of Dr. Worthington, on the subject of captain Gordon's health, previous to his being wounded, viz. that he had been subject to cough, and was threatened with a pulmonary affection, all which the bleeding from the wound appeared to remove. A similar instance is related to me by Dr. Wheaton of Providence, in a case where a musket ball passed through the right lung of a young man labouring under phthisis pulmonalis. The hæmorrhage was very profuse, but was followed by a speedy recovery, both from the wound and phthisical affection. *Quere.* Do not these facts speak in favour of copious bleeding as a remedy for consumption, as recommended by Dr. Gallup, and some other physicians of the present day?

*An answer to Dr. SPALDING's letter on Ergot. By JOHN STEARNS M. D.*

[Communicated for the New England Journal of Medicine, &c.]

**A**FTER I had announced to the public the medicinal virtues of the Ergot in 1807, I had determined to make no